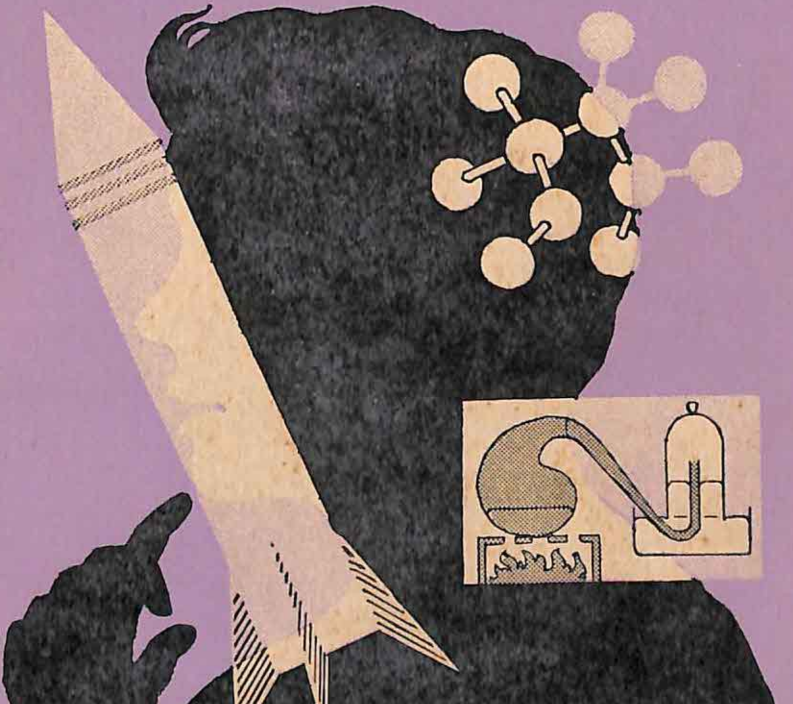
2065

WORKBOOK FOR SCIENCE IN EVERYDAY LIFE

BOOK FOUR

by
A. VERSTRAETEN
and
N. A. WATTS

STATE INSTITUTE OF EDUCATION
BANIPUR



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WORKBOOK FOR
SCIENCE IN EVERYDAY LIFE

BOOK FOUR

SELF-TESTING EXERCISES TO ACCOMPANY
THE TEXT-BOOK

By

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AND

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With a Foreword by

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FOREWORD

As a result of the advances in Science and Technology the vocational foundations of the structure of Society are changing and, therefore, it is essential for all Secondary School pupils to be familiar with certain scientific ideas which underlie progressive thought and activity at all levels.

The purpose of this series of General Science books is to provide such pupils with a broad basic knowledge of scientific facts.

Mere instruction in Science will not capture what is termed the 'spirit of science'. Westaway rightly points out: "The spirit of science cannot be weighed and measured even if weighing and measuring are necessary for tracking it down. It is not enough to track it down, it must be captured...." The authors have succeeded, I believe, in presenting scientific ideas in a manner which will not only instruct but interest pupils and thus help them to capture the spirit of Science.

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Secretary to the Inter-State Board for
Anglo-Indian Education,
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Examination (University of Cambridge Local
Examinations Syndicate)

SCIENCE IN EVERYDAY LIFE

Books I, II, III and IV

Workbooks I, II, III and IV to accompany each text-book.

Teachers' Manual including Key to Workbooks.

PREFACE

Science has come to form such an integral part of our daily lives that a knowledge and understanding of its facts is regarded as one of the major goals of education. Furthermore, the development of a scientific attitude and a knowledge of how to apply the methods of science to the solution of personal problems is regarded as an important outcome of the educational process.

The workbooks accompanying the series of books entitled 'SCIENCE IN EVERYDAY LIFE' are designed to meet the problems of learning meaningful scientific facts and their translation into life patterns. They include material and suggested experiences through which the student can check his knowledge of facts, clinch his understanding of the basic concepts developed in the text and gain practice in the skills of solving problems, evaluating and interpreting facts, testing hypotheses, formulating generalisations and applying his understanding to everyday situations. The tests in the workbook also furnish the teacher with an instrument of measuring individual pupil differences in capacity and achievement and the status of the class as a whole, while a critical survey of the scores afforded by the tests reveal the efficiency of certain methods of instruction.

Each workbook contains tests which are constructed parallel to the chapters in the text-book it accompanies, so that the student's mastery of each chapter is facilitated. At the end of each part or book are tests which require the integration of the knowledge gained in the preceding chapters in order to be answered correctly.

The sheets in the workbook may be distributed separately in schools where a loose-leaf file is in use for the subject, or the workbook can be used intact. In either case, the corrected exercises should be readily available as a reference for study and review.

The key for each workbook is included in the Teachers' Manual accompanying the series of text-books.

A. VERSTRAETEN
N. A. WATTS

STATE INSTITUTE OF EDUCATION

NAME________________________ CLASS____________ DATE____________

TESTS ON CHAPTER I

ELECTRICITY IN MODERN LIFE

Recall

1. State :

a. The law of force between electric charges.

____

b. The definition of Electro-motive force.

____

____

c. Ampère's rule.

____

____

____

d. Four ways of increasing the strength of a magnetic field due to a conductor carrying a current.

i.______________________________________

ii.______________________________________

iii.______________________________________

iv.______________________________________

e. Three factors which affect the flow of electric current through a conductor.

i.______________ **ii.**______________ **iii.**______________

Recognition

2. Select the number of the item that best completes the statement and write it on the blank space at the left of the statement.

______**a.** The insulator used in an electric stove is (i) nicrome; (ii) iron; (iii) manganin; (iv) porcelain.

______**b.** The centre terminal of a Leclanché cell is (i) negative; (ii) carbon; (iii) zinc; (iv) brass.

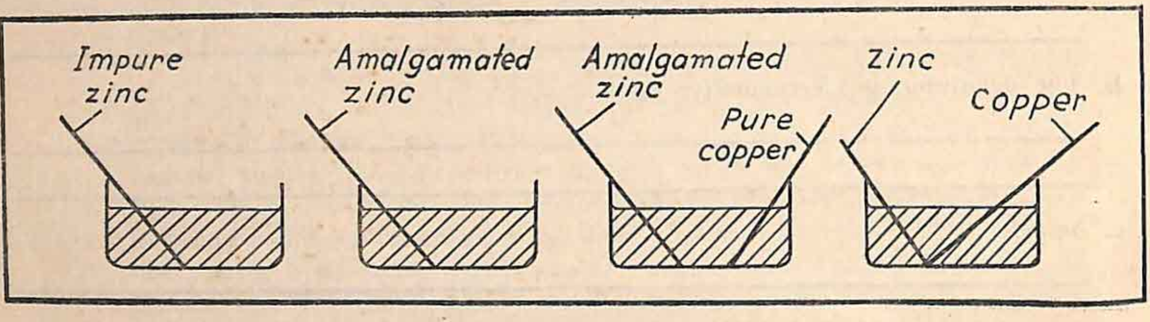
______**c.** The amount of current flowing through a household circuit depends on (i) the resistance of the entire circuit; (ii) the electrical pressure or potential difference which forces the current to flow through the circuit; (iii) both; (iv) neither.

______**d.** If a lamp bulb is operated below the voltage marked on it (i) the light will be dim; (ii) the fuse will 'blow'; (iii) the bulb will not last long; (iv) the consumption of electricity will be high.

______ **e.** When you switch on an electrical appliance at home you have (i) an open circuit; (ii) a closed circuit; (iii) a short circuit; (iv) a series circuit.

Understanding

3. Each vessel contains dilute sulphuric acid. Different materials as specified are put into the vessels as shown.



i. ________ **ii.** ________ **iii.** ________ **iv.** ________

________ ________ ________ ________

a. Below each vessel, write the chemical action (if any) that occurs.

b. State a defect of the voltaic cell.

____

c. How is this defect caused?

____

d. How is this defect corrected in the Leclanché cell?

____

e. Which diagram shows the principle of the voltaic cell?

____

4. Two electric bulbs, $\mathbf{L_1}$ and $\mathbf{L_2}$ and two keys **A** and **B** are connected as shown in the diagram. What bulb(s) light up when:

a. The key **A** is depressed?

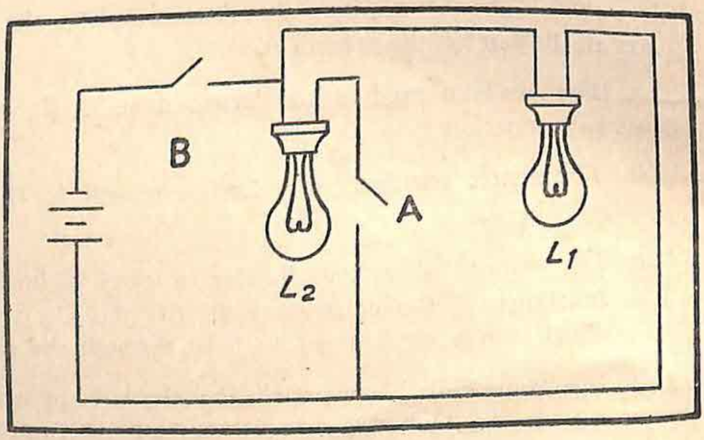
____

b. The key **B** is depressed?

____

c. Both keys are depressed at the same moment?

____



NAME____________________ CLASS__________ DATE__________

5. Complete this table which summarises the magnetic effect of a current in a conductor.

Situation in which a compass needle is placed	*Direction in which the North Pole of the compass needle tends to be deflected*
Over a north-flowing current	
Beneath a north-flowing current	
Over a south-flowing current	
Beneath a south-flowing current	
At the side of a current flowing upwards	
At the side of a current flowing downwards	
At the centre of a current-carrying coil arranged parallel to the earth's magnetic field	
In front of a current-carrying coil wound in a clockwise direction	

6. Complete the table to indicate the type of transformation of energy brought about by the electrical appliances listed.

Appliances	*Energy Change*
Toaster	
Incandescent bulb	
Electrified ebonite rod	
Electric bell	
Dry cell	
Electro-magnet	
Electrolytic cell	
Thermo-electric loop	
Photo-electric cell	
Electric motor	
Dynamo	
Fluorescent bulb	
Accumulator (being charged)	
Accumulator (being discharged)	

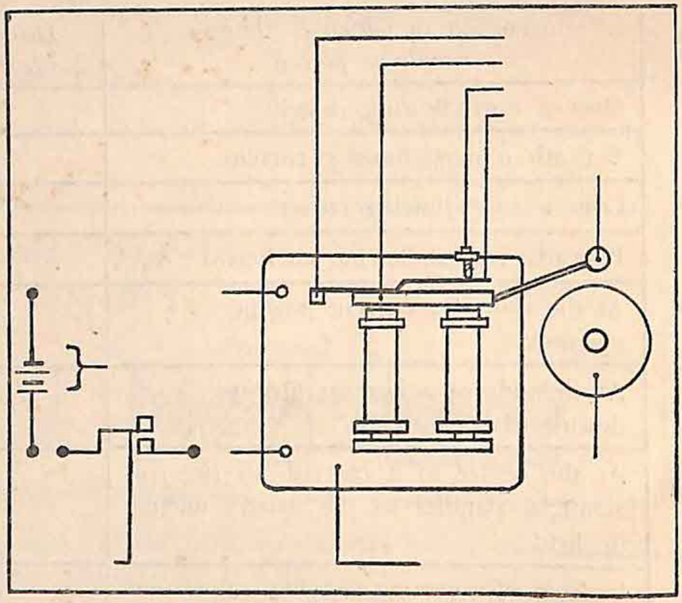
7. **a.** Insert the wiring on the diagram of the electric bell given below.

b. Label the different parts.

c. Insert arrow heads on the wiring to show the route taken by the current when the switch is depressed.

d. Label the polarity of the electro-magnet and that of the armature.

e. How could the circuit be altered so as to ring only once when the key is depressed?



8. In a single room, a man has the following electrical appliances. Complete the table and thereafter calculate his electric bill at 18·75 P. per unit.

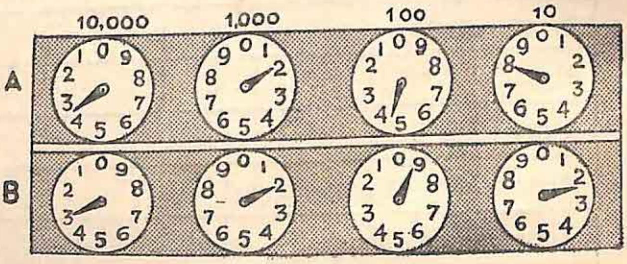
Electrical Appliances	*Voltage (in volts)*	*Current (in amperes)*	*Resistance (in ohms)*	*Power (in watts)*	*Time in use (in hours)*	*Electrical energy used (in Kw. Hr.)*
Radio	240	·25			2	
Ironer	240			480	½	
Bedside bulb	250			25	4	
Lamp bulb			62	100	5	
Heater		10	25		1	
					Total Kw. Hr.	

The cost of electricity at 18·75 P. per unit is

9. Read these meters. Find how many units of electricity have been consumed and thereafter calculate the electricity bill at 18·75 P. per unit.

a. Reading of meter on 4.2.'62.

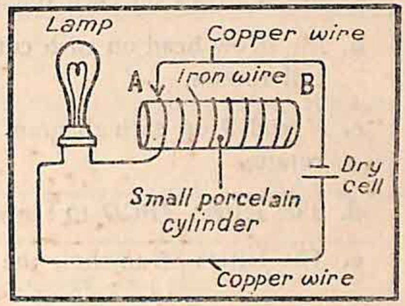
b. Reading of meter on 3.3.'62.



NAME______________________________ CLASS____________ DATE____________

c. Units of electricity used______________________________

d. The cost of electricity at 18·75 P. per unit is______________________________



10. The iron wire wound around the cylinder is touched at point *A* by one end of the copper wire as shown. Thereafter, the end of the copper wire is gradually moved towards *B* and the intervening coils are touched. Mark **X** in the blank space before the statement of your choice.

______**a.** The lamp will not light.

______**b.** The lamp will have uniform brightness throughout.

______**c.** The brightness of the lamp will vary.

Mark **Y** in the blank spaces at the left of any of the statements listed below if it justifies the statement which you have selected in the above list.

______ **i.** As the copper wire moves from *A* to *B* the length of iron wire in the circuit is increased.

______ **ii.** The cylinder is an insulator.

______ **iii.** A switch is absent from the circuit.

______ **iv.** The resistance of the circuit is gradually increased.

______ **v.** When an iron wire is wound into a spiral it conducts electricity at the same rate as copper.

______ **vi.** Less current flows through the circuit.

______ **vii.** One end of the iron wire is left free.

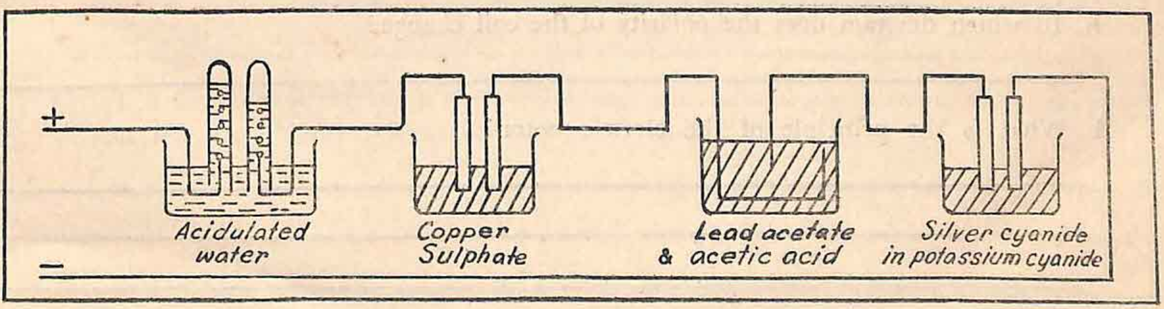
______**viii.** By coiling the iron wire into a spiral a larger length of it enters into the circuit.

______ **ix.** Two different metals make up the circuit.

______ **x.** Both copper and iron conduct electricity.

______ **xi.** The filament of the lamp will allow only a certain amount of electricity to pass through it.

11. Beneath each vessel is the name of the electrolyte contained in it. Indicate with arrows the substance(s) liberated and the place from where they are liberated.


+
—
Acidulated water
Copper Sulphate
Lead acetate & acetic acid
Silver cyanide in potassium cyanide

12. The three diagrams below illustrate the principle of the electric motor. On the diagrams mark:

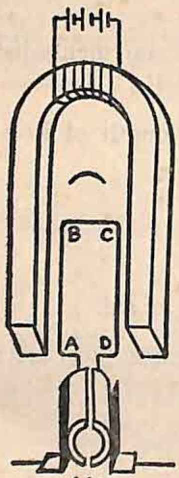
a. Arrow heads on each diagram to show the direction of the current.

b. An arrow head on each curve at the top of the coil to show the direction in which the coil rotates.

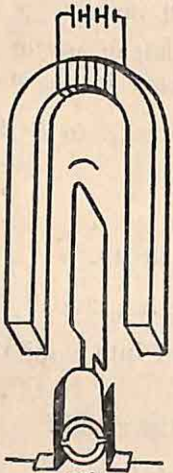
c. *N* and *S* on each diagram to show the polarity of the magnet between which the coil rotates.

d. The letters *ABCD* to show the rotation of the coil in the second and third diagrams.

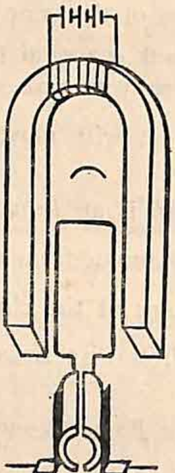
e. The letters *SE* to show the source of electricity.



(i)



(ii)



(iii)

Answer the following questions.

f. What is the nature and direction of the force which exists between the two poles of the magnet?

g. What device is used to reverse the current in the coil *ABCD* every half turn?

h. In which diagram does the polarity of the coil change?

i. What is the principle of the electric motor?

NAME________________________ CLASS____________ DATE____________

j. Why does the armature of an electric motor which is running freely take some time to come to rest after it is switched off.

13. Explain each of the following facts.

a. One faulty bulb in a string of 'fairy lights' on a Christmas tree will cause all the others to cease lighting.

b. The handles of an electrician's pliers are covered with rubber.

c. Birds sit on wires carrying an electric current, yet they are not electrocuted.

d. The air in cotton and paper mills is humidified.

e. A conductor carrying electricity in the house gives a very great shock, whereas the conductor of an electric torch gives no shock at all.

f. The wires leading to an electric stove do not get as hot as the wires in the stove.

g. Too many appliances must not be included in a household circuit, nor must they be used for a long time.

h. When an electric current is passed through two coils of wire connected in series, one coil becomes red-hot while the other coil remains cool.

i. All the electrical appliances in a home are connected in parallel, yet main switches and fuses are connected in series.

____

____

____

____

____

j. It is dangerous to use a thick piece of copper wire to replace a burnt-out fuse.

____

____

____

Score:__________ **Teacher's initials:**______________

NAME________________________________ CLASS______________ DATE______________

TESTS ON CHAPTER II

ELECTRICITY IN COMMUNICATION

Recall

1. Name :

a. Three persons who established the foundations of wireless communication

i.______________________ **ii.**______________________ **iii.**______________________

b. The most essential requirement for producing electro-magnetic waves.

____

c. Two important gadgets which help in producing rapid electric oscillations in a circuit.

i.________________________________ **ii.**________________________________

d. The particular branch of electricity which has greatly improved wireless transmission.

____

e. The three essential parts of a triode valve.

i.______________________ **ii.**______________________ **iii.**______________________

f. Three important functions of the triode valve.

i.______________________ **ii.**______________________ **iii.**______________________

g. The gadget that has made television possible.

____

h. The function of **1. g.**

____

i. An essential part in a receiving television set which lights up under the impact of a stream of electrons.

____

j. The part of a triode valve which is at the highest potential.

____

2. Answer the following questions.

a. Why is electricity especially useful for long distance communication ?

____

____

b. What is the effect of a person speaking loudly into the transmitter of a telephone ?

____

____

c. How is it that long electro-magnetic waves can be received at points very distant from the emitting station?

____

d. Why does the A.C. supply of a town not provide a practical way of producing electro-magnetic waves?

____

e. How do you tune in your receiving set to an incoming wave of a given wave-length?

____

3. In the case of telegraphic communication, either by wires or by wireless, state:

a. Two points which are common to both.

i. ______________________________

ii. ______________________________

b. Two points of difference.

i. ______________________________

ii. ______________________________

____

____

4. Name ten stages a song produced at a transmitting wireless station passes through before it reaches the ears of a person listening in at a receiving station.

i. ______________________________

ii. ______________________________

iii. ______________________________

iv. ______________________________

v. ______________________________

vi. ______________________________

vii. ______________________________

viii. ______________________________

ix. ______________________________

x. ______________________________

Recognition

5. If a statement is true, write the word 'True' in the blank space below the statement; if false, write the word(s) which should be substituted for the italicised word(s) to make the statement true.

NAME______________________________ CLASS____________ DATE____________

a. The *electro-magnet* is an essential part of the telegraph sounder.

____

b. The current impulse of a telephone transmitter increases when the carbon particles have *less pressure* acting on them.

____

c. *Light* waves are reflected or refracted downwards by the ionosphere.

____

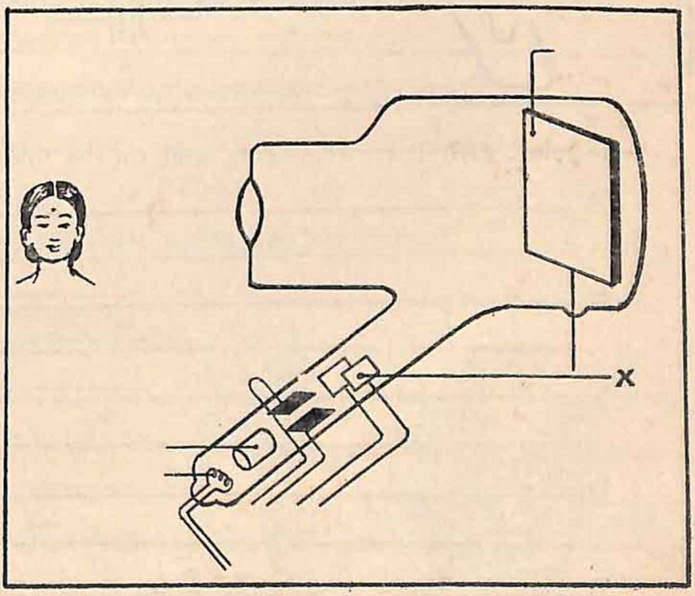
d. The *triode valve* can change a beam of light into an electric current.

____

e. The screen in an iconoscope consists of *many photo-electric cells.*

____

Understanding



6. a. Identify the device represented in the diagram.

____

b. What use is made of this device in television?

____

____

____

c. Show :

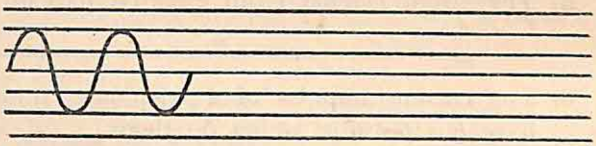
- **i.** By means of unbroken arrows, how the lens focuses light from the object on to the screen, and draw the image.
- **ii.** By means of a broken arrow, the path and direction of the electron beam.
- **iii.** By means of heavy-headed arrows, the path and direction of the photo-electric impulses.

d. Label the parts of the device indicated by guide lines.

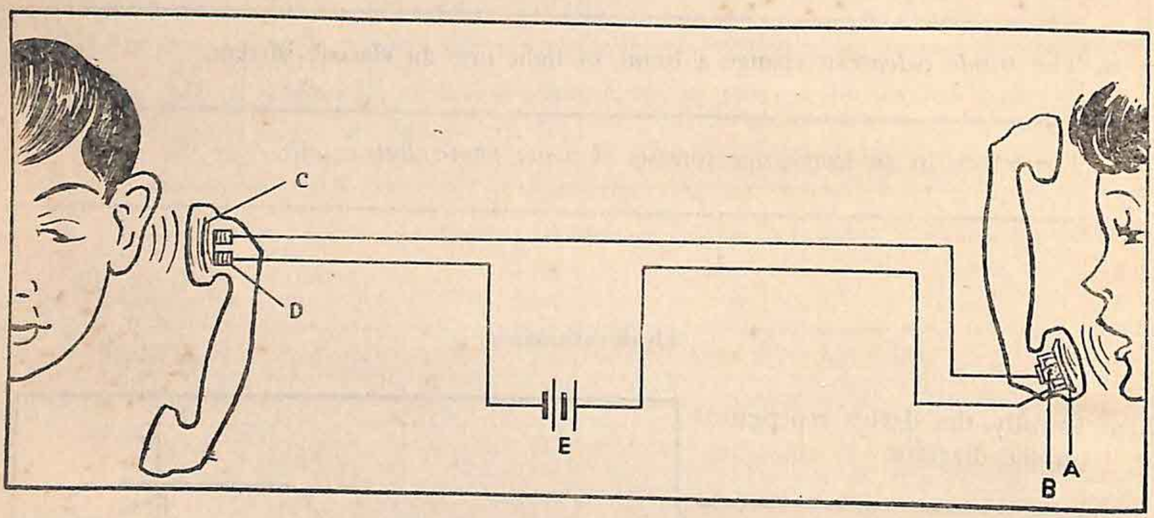
e. What is the function of the part marked *X*?

____

7. Drawn at the right of the page is a diagrammatic representation of a radio-frequency wave as sent out from a radio station. Show, by making an additional sketch to the drawing, how this wave may change when the broadcast of a song begins.



8. The diagram below shows a telephone system.



State what each letter represents, and on the line below, state its function.

A.

B.

C.

D.

E.

Score:

Teacher's initials:

NAME____________________ CLASS__________ DATE__________

TESTS ON CHAPTER III

LISTEN TO THE SOUND

Recall

1. State:

a. Two ways in which sound resembles light.

i.____________________

ii.____________________

b. Two ways in which a vibrating wire can be altered in order to produce a higher note.

i.____________________

ii.____________________

c. Two properties of sound which are not possessed by light.

i.____________________

ii.____________________

d. The change that must be made to an organ pipe for it to give a high note.

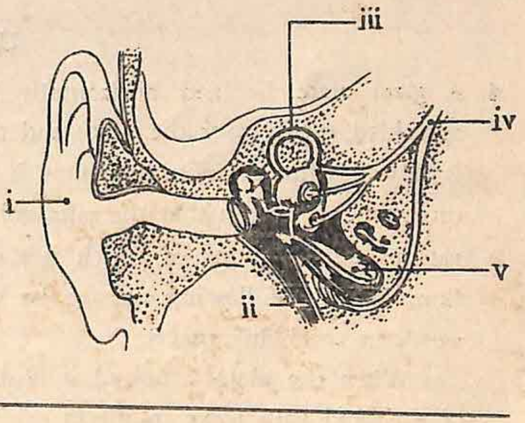
____

e. The property of sound waves illustrated by the production of an echo.

____

2. The diagram represents the human ear.
What are the names and functions of the parts labelled as follows:

i.____________________



ii.____________________

iii.____________________

iv.____________________

v. ____

____

Recognition

3. If a statement is true, write the word 'True' in the blank space below the statement; if false, write the word which should be substituted for the italicised word to make the statement true.

a. Sounds are produced by materials in a state of *motion*.

____

b. Liquids conduct sounds *more* readily than gases.

____

c. To avoid unwanted echoes in a large hall, the walls and ceilings must be covered with a material that *reflects* air vibrations.

____

d. A violinist tunes his violin by adjusting the *length* of its strings.

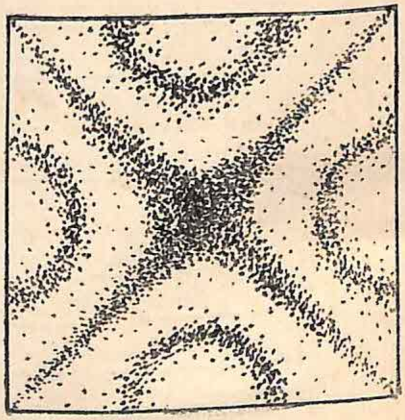
____

e. The strings of a guitar producing high notes are *thicker* than those producing low notes.

____

Understanding

4. A glass plate is fixed horizontally by a screw passing through its centre. Sand is then sprinkled evenly over the plate and the edge of the plate is bowed with a violin bow that is moved in a vertical direction. It is seen that the sand collects in lines to form various patterns, one of which is shown in the diagram. Complete the following passage by writing one or more words in the blank spaces.



When the plate is bowed it begins to________. Most of the sand rolls away in places where the plate is________ ________while the sand collects in those places where the plate is________________. The patterns formed by the sand thus show us________________________________.

NAME____________________ CLASS__________ DATE__________

5. Complete the following table.

Musical instrument	*Vibrating source*
Piano	
Gramophone	
Trumpet	
Drum	
Clarinet	

6. Account for each of the following facts.

a. When the prongs of a fork are struck against a hard object, a distinct note can be heard.

b. If, when the prongs of a fork are vibrating, the handle is made to touch the top of a table, there is an increase in the volume of sound produced.

c. There is a difference in effect when a sound is produced first in a room with many pieces of furniture in it, and then in the same room with all the furniture removed.

d. When a boy whistles, he changes the cavity inside his mouth to produce the different notes of the scale.

e. Although all four strings of a violin are of the same length, the sound emitted by each of them is different.

7. Solve these* problems.

a. If you were watching a cricket match at a distance of 275 yards from the batsman, how long will it be before you heard the sound of the batsman striking the ball?

b. During a thunderstorm a boy noted that he hears the thunder 8 seconds after seeing a distant flash of lightning. How far away is the boy from the centre of disturbance?

c. A boy stands 550 yards from a cliff. What interval of time must elapse before the echo of his voice reaches him from the cliff?

d. A boy made a 'musical instrument' by filling several tumblers with water up to different levels. After much practice, and by carefully adjusting the level of water in each tumbler to produce a desired note, he finally succeeded in playing a simple melody. He thereafter left the tumblers with their contents on a shelf. When he returned to them a week later in order to demonstrate his 'musical instrument' to a friend, he found that his 'instrument' was out of tune. Explain.

e. A speaker is heard more readily in the room of a house than in the open air Explain.

Score: ______________ **Teacher's initials:** ______________

---

* In these problems assume that the speed of sound in air is 1,100 ft. per sec.

NAME ____________________ CLASS ____________ DATE ____________

TESTS ON CHAPTER IV

ALL KINDS OF WAVES

Recall

1. Define :

a. Amplitude.

b. Periodic time.

c. Frequency.

d. Velocity of propagation of a wave.

e. Wave-length.

2. What is the relationship between each of the following pairs ?

a. The loudness of a sound and its distance from the source of the sound.

b. The loudness of a sound and the amplitude of the vibrations causing the sound.

c. The loudness of a sound and the area of the vibrating body.

d. Frequency and wave-length.

3. Differentiate between each of the following pairs.

a. Transverse and longitudinal wave-motions.

b. Interference and diffraction.

c. Light waves and sound waves.

Recognition

4. Select the number of the item that best completes the statement and write it on the blank space at the left of the statement.

_____**a.** The number on a tuning fork is its (i) frequency; (ii) amplitude; (iii) wave-length; (iv) serial number.

_____**b.** The parts of an atom that swing around its nucleus are called (i) molecules; (ii) accessory atoms; (iii) electrons; (iv) positive nuclei.

_____**c.** In fluorescent lamps the material that emits ultra-violet radiations is (i) a fluorescent salt; (ii) mercury vapour; (iii) hydrogen; (iv) helium.

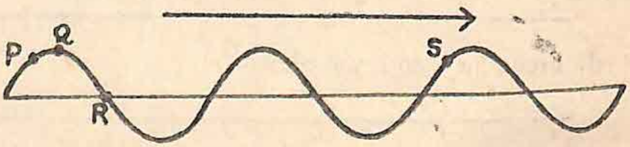
5. On the blank space at the left of the following, write the numbers 1 to 7 in the order of the largest wave-length to the smallest wave-length.

_____**a.** Gamma rays._____**b.** Heat rays._____**c.** Infra-red rays._____**d.** Ultra-violet rays._____**e.** Visible light rays._____**f.** Wireless waves._____**g.** X-rays.

Understanding

6. The diagram represents a section of a water wave advancing in the direction as shown by the arrow. *P, Q, R* and *S* are particles on the wave.

a. Label on the diagram amplitude and wave-length.



b. Which among the particles :

i. Has the maximum displacement ?

ii. Is in its mean position ?

iii. Are in the same phase ?

c. On the diagram, draw a wave having the same amplitude, but twice the frequency of the given wave.

NAME______________________________ CLASS__________ DATE__________

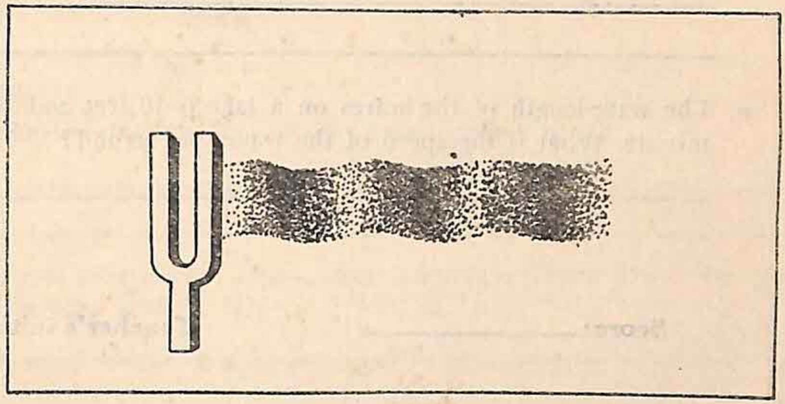
7. The diagram shows the compressions and rarefactions set up in the air by the vibrations of the right-hand prong of a tuning fork.

Mark on the diagram:

a. The letters *C* and *R* to indicate compressions and rarefactions.

b. A horizontal broken arrow headed at both its ends to show the distance of one wave-length.

c. A horizontal arrow headed at both ends to show the direction of vibration of the right-hand prong of the tuning fork.



d. A horizontal heavy-headed arrow to show the direction in which the wave moves.

e. Mark a vertical arrow on the diagram labelled *A* to show a crest, and another labelled *B* to show a trough.

f. What kind of wave-motion is illustrated here?

____

8. Solve these problems.

a. A ship anchored at 5,040 ft. from a cliff sends out a sound having a frequency of 224 vibrations per second. Assuming that the speed of sound in air is 1,120 feet per second, calculate (**i**) the wave-length of the sound; (**ii**) the number of waves that will be propagated from the ship to the cliff.

i.____________________ **ii.**____________________

b. Calculate the frequency of a wireless transmitter broadcasting on a wave-length of 1,500 metres. (Velocity of light=300,000 Kilometres per second.)

____

c. A bat in flight sends out a sound having a wave-length of ·014 feet. (**i**) Calculate the frequency of the sound it emits assuming that the speed of sound is 1,120 feet per second. (**ii**) State, giving a reason, whether a person in its vicinity can hear the sound it has emitted.

i.______________________________

ii.______________________________

____

d. A musical programme broadcast from a public hall in Delhi is heard by a man in

Madras listening by means of his wireless set, before the audience at the back of the hall in Delhi hears the actual sounds. Explain.

e. The wave-length of the waves on a lake is 10 feet and 18 waves pass a floating log per minute. What is the speed of the waves per second?

Score: ______ **Teacher's initials:** ______

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TESTS ON CHAPTER V

ATOMIC ENERGY

Recall

1. Answer the following questions.

a. Why do we say that radio-active substances continuously produce energy ?

b. How does the production of energy from radio-active substances differ from the production of energy by burning coal or oil ?

c. Why do we say that radio-active atoms are transmuted into other atoms ?

d. How are the many different radio-active substances related to one another ?

e. What is meant by 'The atomic mass of carbon is 12, and its atomic number is 6' ?

f. Why is it true to say that 55·8 grams of iron and 197·2 grams of gold contain the same number of atoms ?

g. How does the mass-energy formula explain the production of energy by radio-active substances ?

h. What makes a chain reaction possible ?

31.8.05
11896

i. How is electricity obtained from an atomic reactor?

____

____

____

____

j. What is the purpose of a breeder reactor?

____

2. Name :

a. Three scientists specially connected with the discovery of radio-activity.

i.__________ **ii.**__________ **iii.**__________

b. Two scientists who put order in the lists of radio-active substances.

i.__________ **ii.**__________

c. Three fundamental particles found in every atom.

i.__________ **ii.**__________ **iii.**__________

d. Two ways of releasing atomic energy.

i.______________________________

ii.______________________________

e. The ray given off by radium which is repelled by a plate charged with negative electricity.

____

3. State :

a. Three properties which distinguish radio-active substances from other substances.

i.______________________________

ii.______________________________

iii.______________________________

b. Four essential conditions for a successful controlled chain reaction.

i.______________________________

ii.______________________________

iii.______________________________

iv.______________________________

c. Four main stages in atomic fission.

i.______________________________

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ii.____

iii.____

iv.____

d. Three properties of gamma rays.

i.____

ii.____

iii.____

e. Three differences between an atomic energy plant and an ordinary coal or oil burning plant.

i.____

ii.____

iii.____

Recognition

4. Select the number of the item that best completes the statement and write it on the blank spaces at the left of the statement.

______**a.** When we speak of uranium 235 the number refers to (i) the number of attempts previously made to discover it; (ii) the number of protons contained in the nucleus of a uranium atom; (iii) the atomic mass of a uranium isotope; (iv) the number of parts a uranium atom splits into when bombarded by a neutron.

______**b.** When an atom is split into two or more parts the process is called (i) fusion; (ii) radio-activity; (iii) an uncontrolled chain reaction; (iv) fission.

______**c.** One of the first elements made by scientists was (i) uranium; (ii) radon; (iii) neptunium; (iv) helium.

______**d.** The parts of an atom that revolve around its central nucleus are called (i) electrons; (ii) ions; (iii) protons; (iv) neutrons.

______**e.** The sun derives its energy from (i) the fusion of helium atoms; (ii) the oxidation of its elements; (iii) uncontrolled chain reactions; (iv) certain unknown fuels.

5. Group I is a list of terms used in the text. Group II is a list of definitions. Write the letter of each term in the appropriate blank space in Group II at the left of its definition.

Group I

A. Alpha rays.
B. Atom bomb.
C. Atomic reactor.
D. Beta rays.
E. Breeder reactor.
F. Chain reaction.
G. Fission.
H. Neutron.
I. Radio-activity.
J. Uranium.

Group II

______ **i.** Fast travelling electrons.

______ **ii.** Rays consisting of helium nuclei.

______ **iii.** Particle causing fission.

______ **iv.** Splitting of atom in nearly equal parts.

______ **v.** A series of spontaneous atomic fissions without outside interventions.

______ **vi.** Property of emitting radiant energy through atomic disintegrations.

______ **vii.** Arrangement for controlled chain reaction.

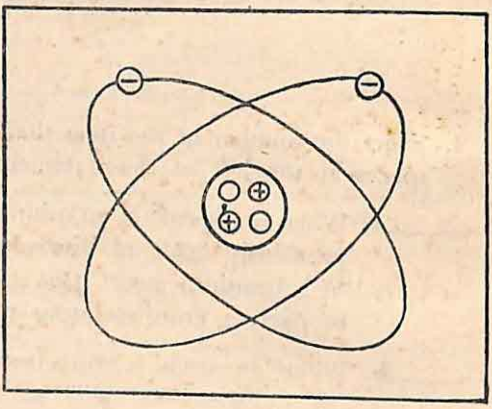
______ **viii.** Arrangement for controlled chain reaction producing plutonium.

______ **ix.** Element which on absorbing a neutron splits into two.

______ **x.** Arrangement for uncontrolled chain reaction.

Understanding

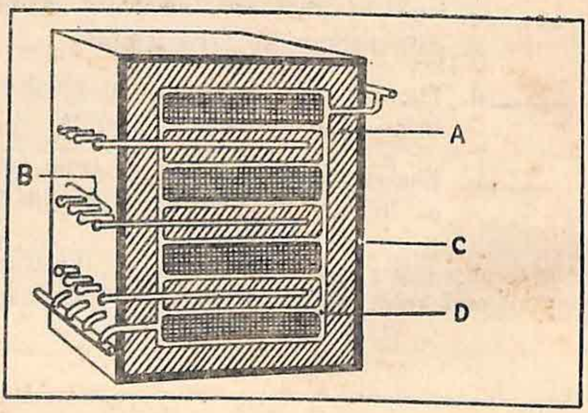
6. Label on the diagram of a helium atom at the right the letters: *e,* for electrons; *N,* for nucleus; *p,* for protons and *n,* for neutrons.



7. The atomic mass of an atom being represented by *A* and its atomic number by *Z,* indicate, by using these symbols, the number of protons and neutrons contained in the atomic nucleus.

____

8. In the diagram of an atomic pile, identify the parts and state the function of each part.



A. ______________________________

____

B. ______________________________

____

C. ______________________________

____

____

D. ______________________________

Score: ____________ **Teacher's initials:** ____________

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TESTS ON CHAPTER VI
MINERALS FROM THE EARTH

Recall

1. Name, in order, four distinct materials that are formed in the process by which plants are changed to coal.

i.__________ **ii.**__________ **iii.**__________ **iv.**__________

2. Complete the following table.

The Metallurgy of Copper

Stage	*Apparatus involved*	*Chemical reaction(s) if any*	*Form of copper at the end of stage*
Powdering			
Roasting			
Smelting			
Converting			
Refining			

3. Name three methods used in the mining of metals.

i.__________ **ii.**__________ **iii.**__________

Recognition

4. Group II is a list of four major needs which man has for constructional materials. Group I is a list of physical properties of materials which man considers when selecting materials to meet each of the major needs listed in Group II. Group III is a list of metals. Select the physical properties from Group I which are classified under the broader headings given in Group II and write their letters on the blank space at the left-hand side of the appropriate major need. Select metal(s) from the list of metals in Group III as examples of materials possessing such requirements and write their numbers on the blank space at the right-hand side of the appropriate major need. You may write the number of a metal more than once to show that it answers more than one of man's major needs.

Group I—Physical properties

A. Compressive strength.
B. Easily cut.
C. Elasticity.
D. Ductility.
E. Good electrical conductivity.
F. Hardness.
G. High density.
H. High heat conductivity.
I. High melting point.
J. Malleability.
K. Resistance to chemical action.
L. Tensile strength.

Group II—Major needs

____________ Strong materials ____________
____________ Durable materials ____________
____________ Easily-shaped materials ____________
____________ Energy-controlling materials ____________

Group III—Metals

i. Wrought iron. **ii.** Aluminium. **iii.** Copper. **iv.** Lead. **v.** Tin.

5. Group I is a list of terms used in the text. Group II is a list of meanings. Show that you understand the terms by writing its letter on the blank space before the meaning you associate with the term.

Group I

A. Alloy.
B. Electrolyte.
C. Fuel.
D. Flux.
E. Mineral.
F. Ore.
G. Slag.
H. Steel.

Group II

______ **i.** It is a mineral which occurs in nature from which a metal may be extracted economically.

______ **ii.** It is a material whose chief value lies in its use for the production of energy.

______ **iii.** This is a substance which is added to an ore before heating so that it will react chemically with the impurities.

______ **iv.** It is a fusible compound formed by the union of flux and impurities.

______ **v.** This is a mixture of two or more metals.

______ **vi.** A substance which in the molten state or in solution is decomposed by an electric current.

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______ **vii.** A substance composed of iron and carbon.

______**viii.** An inorganic substance found in the earth's crust.

Understanding

6. a. Name the geological structure shown.

____

b. What may be expected from each of the wells labelled as follows :

i.____________________

ii.____________________

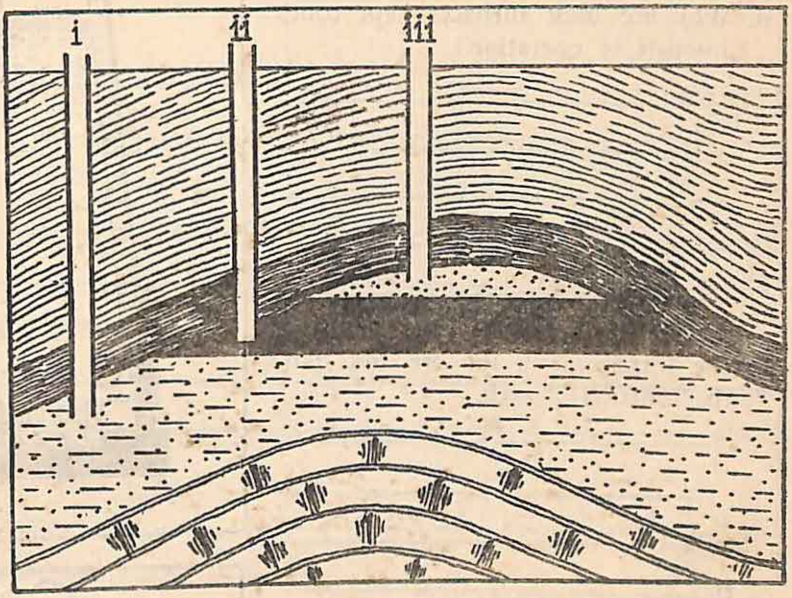
iii.____________________

c. What methods must be employed to extract each of the three substances found in :

i.____________________

ii.____________________

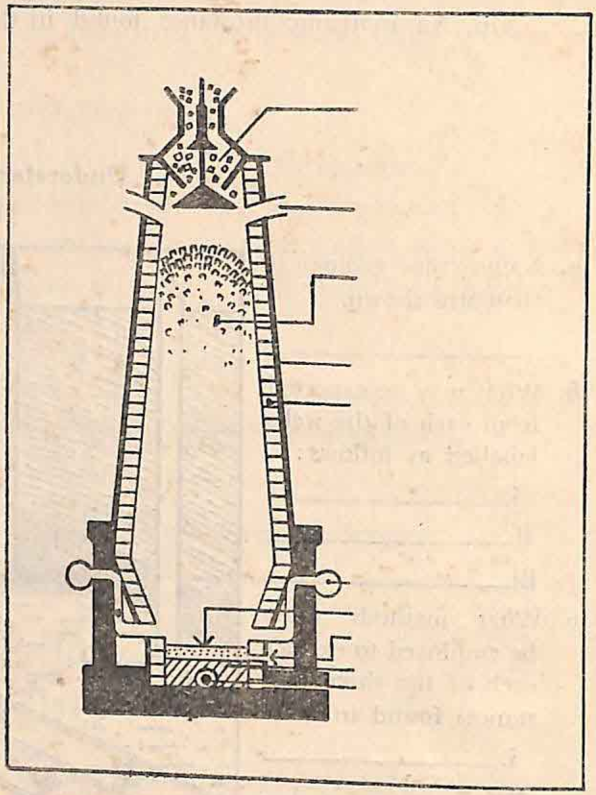
iii.____________________



7. Here is an excerpt from the tale of an atom of aluminium from the time it was removed from the earth, until it became part of an ingot of pure aluminium. Fill in the breaks in the continuity of the tale, by choosing the correct words from this list : alumina, bauxite, carbon, cast, chemicals, cryolite, downwards, electrolytic, hot, molten, mould, oxide, oxygen.

My earliest memory is of myself being part of an ore in Madhya Pradesh called __________. I was removed from the earth and treated with__________. I joined myself with______to form an______called______. In my new form I was dissolved in________and kept in a________state in an___________cell. My new house was lined with_______and there were a number of carbon blocks immersed in the liquid of which I was a part. Wires led away from both the blocks and the lining of my house. Somebody pressed a switch and I found myself becoming very_____and irresistibly drawn ________. I was now drawn into a___________and made into an ingot. People now said I was a part of_______aluminium.

8. **a.** Label the parts of the diagram indicated by guide lines.



b. Draw unbroken arrows to show the direction in which the hot air circulates.

c. Mark an indicating guide line labelled *X* to the point where you think the temperature would be the highest.

d. Why are blast furnaces kept continuously in operation?

____

____

____

____

____

e. Name the two substances fed into the furnace with the ore and state the function of each.

i.____________________________

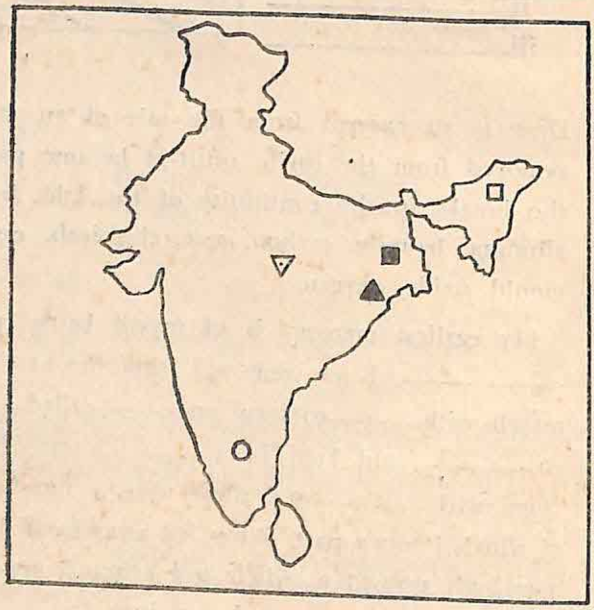
____

____

ii.____________________________

____

9. Study the mineral map of India given on the right, and then fill in the key below by writing at the side of each symbol the mineral that it represents.



□ ____________________________

■ ____________________________

▲ ____________________________

▽ ____________________________

○ ____________________________

Score:____________ **Teacher's initials:**________________

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TESTS ON CHAPTER VII

SYNTHETIC MATERIALS

Recall

1. Differentiate between each of the following pairs, giving two points of difference for each pair.

a. Metals and alloys.

i.____________________

ii.____________________

b. Natural silk and artificial silk.

i.____________________

ii.____________________

c. Plant fibres and animal fibres.

i.____________________

ii.____________________

d. Rubber and celluloid.

i.____________________

ii.____________________

e. Polythene and silicone.

i.____________________

ii.____________________

2. Mention two special qualities required in structural materials for each of the following :

a. Fast aeroplanes.

i.__________ **ii.**__________

b. Chemical industries.

i.__________ **ii.**__________

c. Atomic energy.

i.__________ **ii.**__________

3. State two special characteristics of a giant chain molecule.

i.____________________

ii.____________________

4. Name:

a. Four plant fibres.

i. ____________ **ii.** ____________ **iii.** ____________ **iv.** ____________

b. Four types of animal fibres.

i. ____________ **ii.** ____________ **iii.** ____________ **iv.** ____________

c. Three main elements found in plant fibres.

i. ____________ **ii.** ____________ **iii.** ____________

d. Four main elements found in animal fibres.

i. ____________ **ii.** ____________ **iii.** ____________ **iv.** ____________

e. Two types of light-weight alloys.

i. ____________ **ii.** ____________

f. Three types of molecules which can be linked to similar molecules to build up giant molecules.

i. ____________ **ii.** ____________ **iii.** ____________

g. Two main conditions necessary for the production of plastics.

i. ____________ **ii.** ____________

h. Four important properties of plastics.

i. ____________ **ii.** ____________ **iii.** ____________ **iv.** ____________

i. Three processes for producing plastic filaments, sheets and solid objects.

i. ____________________________

ii. ____________________________

iii. ____________________________

j. Two sources of raw materials for producing plastics.

i. ____________________________

ii. ____________________________

____

5. Answer the following questions.

a. Why are carbon and silicon atoms specially able to produce long chain molecules?

____

b. Why are we able to stretch wool?

____

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c. How can wood, milk and peanuts be used to make such things as clothes and ropes?

____

____

d. How does heat treatment help to bring about the 'permanent wave' in a lady's hair?

____

____

____

e. What is meant by vulcanisation?

____

Recognition

6. Group I is a list of metals and Group II is a list of alloys. Write the letter of the metal in the blank space at the left-hand side of the alloy if it is used as a component of the alloy. Letters may be used more than once in a blank space and repeated in other blank spaces.

Group I—Metals

A. Aluminium.
B. Carbon.
C. Chromium.
D. Cobalt.
E. Copper.
F. Iron.
G. Lead.
H. Magnesium.
I. Nickel.
J. Silver.
K. Tin.
L. Tungsten.
M. Zinc.

Group II—Alloys

______________ **i.** Bell-metal.
______________ **ii.** Brass.
______________ **iii.** Bronze.
______________ **iv.** Duralumin.
______________ **v.** Silver solder.
______________ **vi.** Solder.
______________ **vii.** Stainless steel.
______________ **viii.** Steel.
______________ **ix.** Stellite.
______________ **x.** Tungsten carbide.

7. Select the number of the item that best completes the statement and write it on the blank space at the left of the statement.

______ **a.** If a material can be drawn into the form of a wire it is said to be (i) malleable; (ii) elastic; (iii) ductile; (iv) flexible.

______ **b.** Lanital is obtained from (i) peanut protein; (ii) milk casein; (iii) the silkworm; (iv) corn.

______ **c.** Perspex is (i) an alloy; (ii) a plastic; (iii) another name for celluloid; (iv) a special kind of glass.

______ **d.** Plastics which become soft on heating are called (i) thermo-plastic plastics; (ii) thermo-setting plastics; (iii) insulators; (iv) silicone plastics.

______ **e.** Latex is of (i) plant origin; (ii) animal origin; (iii) mineral origin; (iv) gaseous origin.

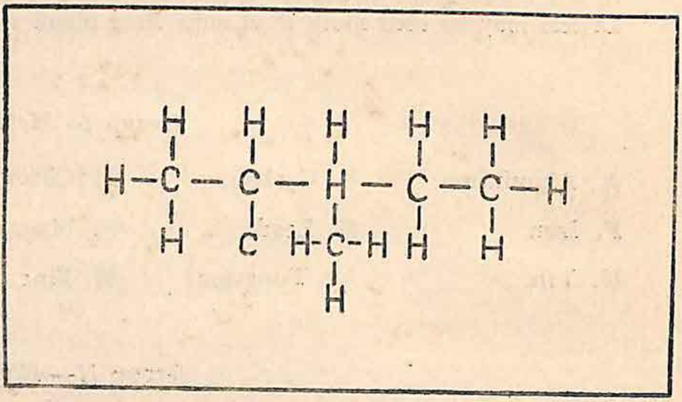
Understanding

8. In the diagram at the right, draw a circle around each of the following and label as indicated.

A. Repeat units.

B. Side atoms.

C. Side branches.



Score: ______________ **Teacher's initials:** ______________________

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TESTS ON CHAPTER VIII

THE CHANGING WORLD OF LIFE

Recall

1. State :

a. Three evidences for evolution.

i.____

____

ii.____

____

iii.____

____

b. Three basic problems that must be solved by animals if their species is to survive.

i.____

ii.____

iii.____

c. Mendel's Laws of Heredity.

i.____

____

ii.____

____

Recognition

2. Select the number of the item that best completes the statement and write it on the blank space at the left of the statement.

_____**a.** The environment (i) is the same everywhere; (ii) never changes; (iii) is always favourable to organisms; (iv) has an important influence in natural selection.

_____**b.** A species providing parental care for its young (i) produces a great many offspring; (ii) fails to survive; (iii) produces few offspring; (iv) becomes successfully adapted to the environment.

_____**c.** The fitness of an organism is determined by (i) the nature of the species; (ii) the kind of environment; (iii) heredity; (iv) the characters it acquires in its lifetime.

_____**d.** An animal possessing an entirely new character which can be passed on to its offspring is called (i) a hybrid; (ii) a mutant; (iii) pure; (iv) a dominant character.

______ **e.** The theory of the inheritance of acquired characters was propounded by
(i) Lamarck; (ii) De Vries; (iii) Wallace; (iv) Darwin.

3. Group I is a list of terms used in the text. Group II is a list of definitions. Write the letter of each term in the appropriate blank space in Group II at the left of its definition.

Group I

A. Acquired character.
B. Chromosome.
C. Fertilisation.
D. Fossil.
E. Gene.
F. Mutation.
G. Ovum.
H. Petrification.
I. Sperm.
J. Zygote.

Group II

______ **i.** The female gamete.

______ **ii.** A minute particle in a chromosome which exercises an influence on one or more hereditary characteristics.

______ **iii.** An organism which has genes of different type for any character.

______ **iv.** The process of combination of a sperm with an egg, initiating the development of a new individual.

______ **v.** The male gamete.

______ **vi.** A record of the remains of life left in a rock strata.

______ **vii.** The production of an offspring which differs from its parents in certain hereditable characteristics.

______ **viii.** A rod of nuclear material formed during cell division, which carries and distributes heredity traits.

______ **ix.** The cell formed by the fusion of two gametes.

______ **x.** The process by which parts of living things are changed to stone.

Understanding

4. Here is a list of some of the principles developed in the text.

A. The size, structure and habits of living things show great variety.

B. All living things tend to produce a large number of offspring.

C. Through the interdependence of various species and by their continued struggle for existence there is a tendency for a balance to be maintained among the many forms of living things.

D. Sometimes offspring show a marked dissimilarity to their parents.

E. Those species that have made satisfactory adaptations and adjustments to their environment have survived.

F. Mutations breed true.

G. Through the application of his knowledge of the laws governing heredity, man can modify the nature of plant and animal forms.

Read the story given below and write the letter of any of the above principles in the appropriate parenthesis (—) if you think that the preceding phrase is an illustration of the principle. A letter may be used more than once.

It was Easter Sunday. A boy and his sister decided to go for a picnic. There were so many beautiful and wonderful things to see: a silk cotton tree covered over with crimson flowers (—); weak-stemmed plants climbing by means of tendrils towards the light (—); butterflies of many hues (—) flitting over the fields, pausing ever so often to sip the nectar of wild flowers (—) and a snail which looked like a small stone (—).

The children stopped awhile to gaze at a poultry farm. Here the birds were separated from each other according to their breed (—). They were particularly interested in a Leghorn rooster which had shorter legs than the others (—). They felt it should be separated from the other Leghorns (—). Accordingly, they went in to discuss the matter with the poulterer, who promptly had the bird removed (—).

Their wanderings next led them to a marshy field. The girl, whose hobby was the collection of wild flowers, was thrilled to discover several new species (—). Among the specimens she collected was the Sundew that fed on flies (—).

Finally, both children chose the shady bank of a pond to enjoy their lunch. Here there were more wonders: a pond heron that resembled a tree trunk (—); fish of different varieties ranging from half an inch to a foot in length (—); a rock with over a hundred moth's eggs laid on it (—); small fish hiding amidst a tangled growth of submerged water plants (—); insects that skated on the water (—) and—their find for the day—a tree bearing white flowers on one branch and yellow flowers on another (—).

5. A farmer wished to build up a herd of dairy cows of high milk-producing ability. Mark **X** on the blank spaces before the suggestions given to indicate what you think would apply to the solution of his problem.

______**a.** Keep only pure-breds.

______**b.** Keep his cattle free from disease.

______**c.** Use a proved sire.

______**d.** Cross-breed his cattle with those of a neighbouring farm.

______**e.** Select his cows on the basis of their milk-yielding ability.

______**f.** Feed his cattle mainly on roughage.

______**g.** Join a cattle-breeder's association.

______**h.** Mate close relatives.

______**i.** Import cattle with the purpose of hybridising.

______**j.** Keep careful records of the ancestry of each animal.

______**k.** Keep only hybrids.

6. A girl selected two annual plants belonging to the same species and which differed in flower colour. She tied a polythene bag around the bud of a red flower and another bag around the bud of a white flower. When the reproductive parts of the two flowers matured, she took pollen from the red flower with a feather, dusted it over the stigma of the white flower and immediately retied the bag over the white flower. Once the seeds formed she sowed them in flower-pots and tended the seedlings. All the offspring bore red flowers.

a. Mark an **X** before any of the following statements if you think it is evidence that is justified by the results.

________The red-flowered plant was a hybrid while the white-flowered plant was of pure strain.

________The colour red is dominant, while white is recessive.

________Both plants were pure strains.

________Both plants were hybrids.

The experiment was continued. Two offspring were chosen and a polythene bag tied around a flower bud of each plant. When the reproductive parts matured, pollen was taken from the stamens of one and dusted on the stigma of the other. The flower of the latter was thereafter securely covered by polythene.

Answer the following questions.

b. If a plant of the first generation, treated as in the second part of the experiment, produced sixteen offspring, how many would be red-flowered ?

____

c. How would you find out which among such offspring were pure reds ?

____

____

d. What would be the colour of the flowers borne by the offspring of white-flowered parents belonging to the second generation ?

____

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e. In the space below, draw a diagram to show how a white-flowered plant may be produced by crossing two red flowers belonging to the second generation.

7. State :

a. Five ways in which a deer is adapted to its environment.

i.______________________

ii.______________________

iii.______________________

iv.______________________

v.______________________

b. Five ways in which a frog is adapted to its environment.

i.______________________

ii.______________________

iii.______________________

iv.______________________

v.______________________

c. Five ways in which a duck is adapted to its environment.

i.______________________

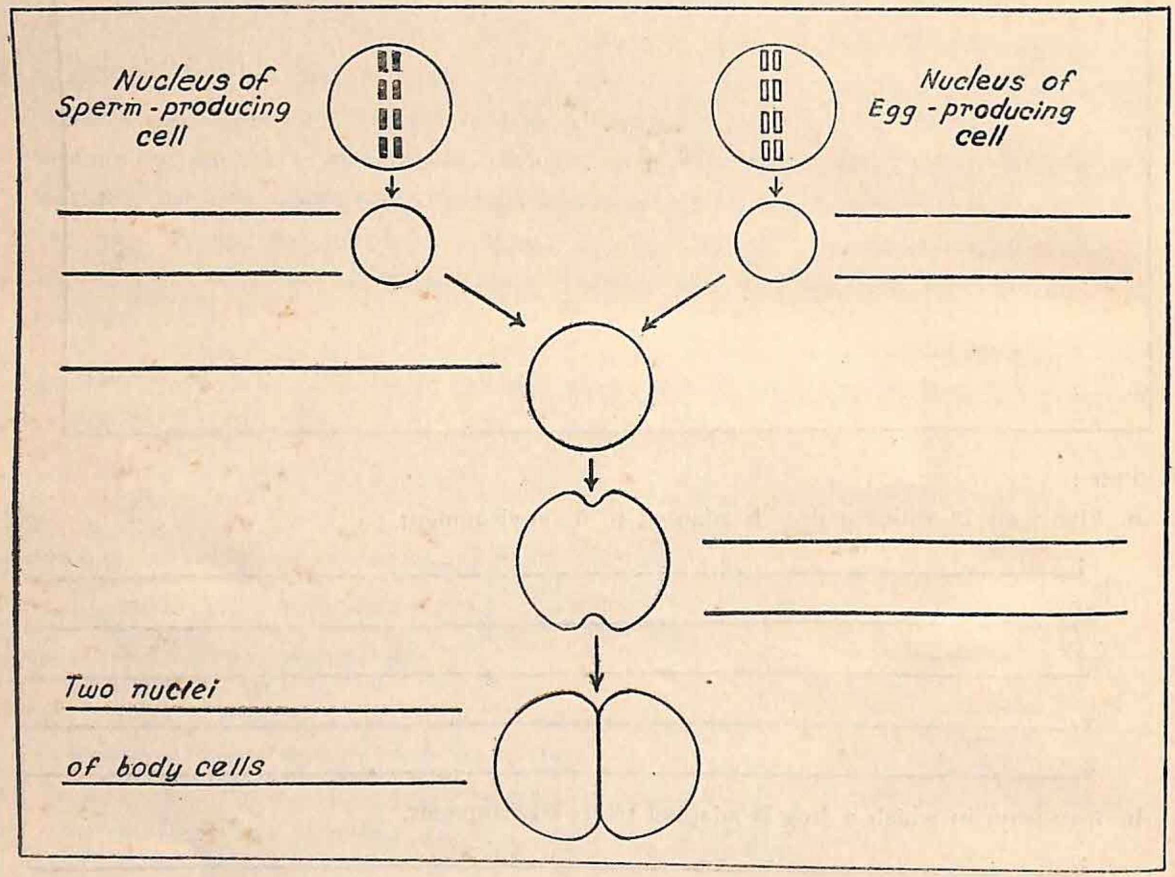
ii.______________________

iii.______________________

iv.______________________

v.______________________

8. Fill in the correct number of chromosomes in each circle. The first two circles represent the nucleus of a sperm-producing cell in the male (left) and the nucleus of an egg-producing cell in the female (right). The last two cells represent two nuclei of the body cells of the offspring. Write on the lines the stage which has been reached.


Nucleus of Sperm-producing cell
Nucleus of Egg-producing cell
Two nuclei
of body cells

Score: ______________ **Teacher's initials:** ______________________

NAME________________________________ CLASS____________ DATE____________

TESTS ON CHAPTER IX

DISEASE AND HOW TO FIGHT IT

Recall

1. Differentiate between each of the following pairs.

a. Communicable and non-communicable diseases.

b. Endemic and epidemic.

c. Streptococci and staphylococci.

d. Antitoxin and antibody.

e. Active immunity and passive immunity.

f. Antiseptic and disinfectant.

g. Natural immunity and acquired immunity.

h. Phthisis and scrofula.

i. Antigen and antibiotic.

j. Serum and hormone.

2. Name :

a. A disease caused by the improper functioning of an organ.

b. Four diseases caused by vitamin deficiency.

i. ____________ **ii.** ____________
iii. ____________ **iv.** ____________

c. Four chemical substances obtained from moulds.

i. ____________ **ii.** ____________
iii. ____________ **iv.** ____________

d. A disease caused by the abnormal growth and division of body cells.

e. Three liquid disinfectants.

i. ____________ **ii.** ____________ **iii.** ____________

f. Two gaseous disinfectants.

i. ____________ **ii.** ____________

g. The kind of plant from which antibiotics are made.

h. The micro-organism causing influenza.

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i. A. chemical used to kill mosquitoes.

____

j. Three forms of plague.

i.__________ ii.__________ iii.__________

3. Complete the following table by assigning each to its proper category: aedes, amoeba, anopheles, ascaris, bacilli, bed-bug, body-louse, culex, flea, head-louse, hookworm, itch mite, plasmodium, sand-fly, scorpion, snake, spirilla, staphylococci, streptococci, tape-worm, trichiniasis, trypanosome, vibrios.

Bacteria	*Protozoa*	*Parasitic insects*	*Parasitic worms*	*Poisonous animals*
1	2	3	4	5

Recognition

4. In this exercise, the first pair of related things show the kind of relationships to look for in the second pair. Complete the second pair of related things.

a. Koch : tuberculosis :: Ross :______.

b. Tonsillitis : streptococci :: blood poisoning :______.

c. Natural disinfectant : sunlight :: physical disinfectant:______.

d. Flea : bubonic plague :: body-louse :______.

e. Culex : dengue :: aedes :______.

f. Snake : fangs :: scorpion :______.

g. Milk : pasteurisation :: water :______.

h. Salivary gland : saliva :: pancreas :______.

i. Infected soil : hookworm :: infected meat :______.

j. Active immunity : antigen :: passive immunity :______.

11886 (SCERT)

5. On the blank spaces at the left of the following phrases write the numbers 1 to 10 to indicate the proper order of the steps in which a hookworm enters a man's body and feeds on his blood.

______**a.** Enters the intestine.

______**b.** Bores its way into the lungs.

______**c.** Secretes a substance to prevent the blood from clotting.

______**d.** Lives in the soil.

______**e.** Passes into the blood stream.

______**f.** Enters the sole of a man's foot.

______**g.** Pierces a blood vessel lining the intestine.

______**h.** Enters the oesophagus.

______**i.** Passes up the windpipe.

______**j.** Feeds on human blood.

6. Complete the following table by marking **X** in the first column against a disease if the body can be immunised against it. Furthermore, choose letters from Group I, II, and III to fill in columns 3, 4 and 5 respectively. Letters may be used more than once and more than one letter may be inserted in a column. Write the micro-organism (if any) causing the disease in column 2.

Group I—Ways by which diseases may be transferred to man.

A. By inhaling infected drops of saliva.

B. By bites from infected insects.

C. By direct contact.

D. By swallowing infected water or food.

Group II—Measures adopted to check the spread of disease.

E. Isolation.

F. Proper sewage disposal.

G. Supply of unpolluted water.

H. Pasteurisation.

I. Disinfection of clothing.

J. Inspection and licensing of restaurants.

Group III—Place of entry into the body.

K. Through a puncture in the skin.

L. Through the membranes of air passages.

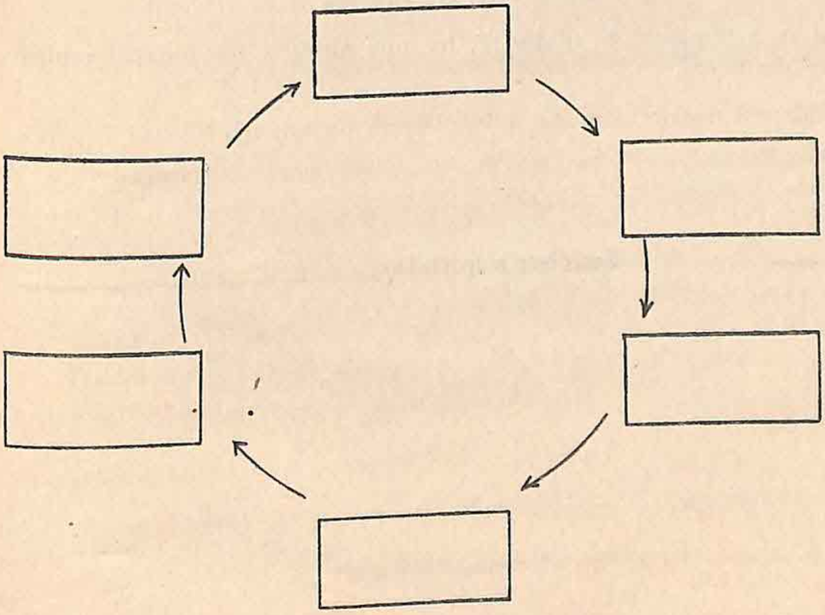
M. Through the membranes of the food canal.

NAME______________________________ CLASS__________ DATE__________

Disease		Micro-organism causing disease	Selection from Group I	Selection from Group II	Selection from Group III
	1	2	3	4	5
Cholera					
Diphtheria					
Dysentery					
Influenza					
Kala-azar					
Malaria					
Plague					
Ringworm					
Scabies					
Tuberculosis					
Typhoid					
Typhus					

Understanding

7. Select the correct word(s) from the list given below and write it (them) on the diagram in the proper place so as to make a general plan showing active immunity



A. Body tissue.

B. Immunity reaction.

C. Antibodies.

D. Neutralise and destroy.

E. Antigens.

F. Enter and attack body cells.

8. This test is designed to determine your ability to distinguish the cause and effect relationship between paired occurrences. Each item is made up of a pair of occurrences which have approximately occurred at the same time. Classify each pair by choosing the appropriate letter from Group I and writing it in the blank space at the side of each item in Group II.

Group I

A. The first causes the second.

B. The first plays a small part in causing the second.

C. The first and second occurrences result from the same general cause.

D. The first does not cause the second.

Group II

______ **i.** A boy discovered a ring-like eruption on his scalp; he began scratching the infected area.

______ **ii.** A man recovered from pneumonia; a week later he suffered from dysentery.

______ **iii.** Plasmodium micro-organisms entered the blood stream of a girl; she suffered from repeated attacks of fever accompanied with shivering and a feeling of cold.

______ **iv.** A man lived in a small ill-ventilated room; he contracted tuberculosis.

______ **v.** A man broke a mirror before going to bed; next morning he was seriously ill.

______ **vi.** A boy suffering from influenza was given a penicillin injection every day; he was cured within a week.

______ **vii.** A boy drank milk infected with bacilli; later he suffered from typhoid.

______ **viii.** Milk was heated to a temperature of 160°F. for one minute; the micro-organisms in the milk were destroyed.

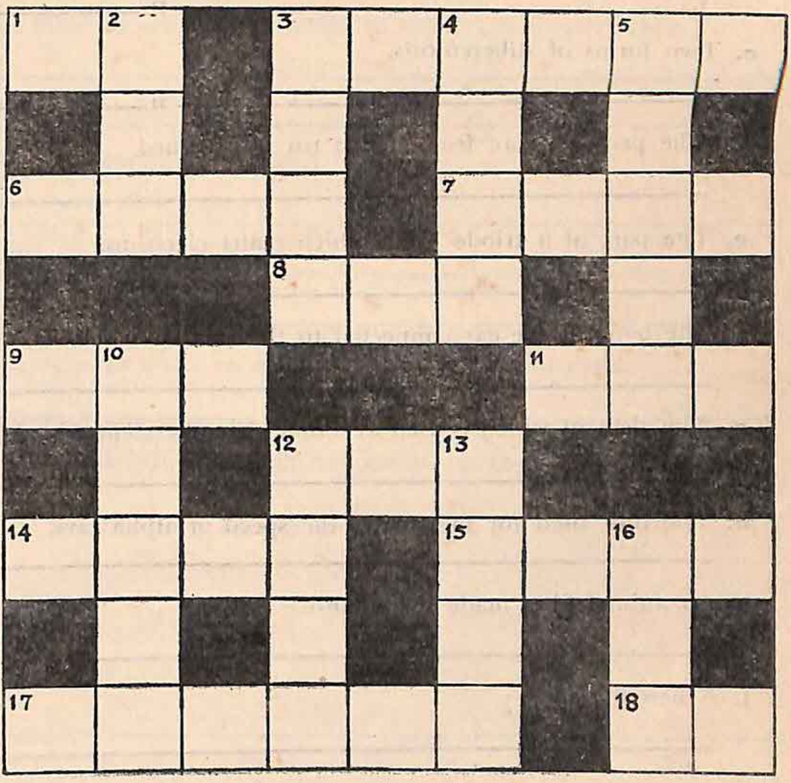
______ **ix.** A girl drank unfiltered water; later she suffered from pneumonia.

Score:______ **Teacher's initials:**______

NAME______________________________ **CLASS**__________ **DATE**__________

TESTS ON BOOK IV

1. Do this crossword puzzle.



Clues across

1. The electrons producing such a current move back and forth at regular intervals in the conductor. 3. An organism which shows a change in a gene in the form of a new characteristic. 6. Indispensible for the measurement of any quantity. 7. An especially strong material produced from animal fibres characterised by having amino-acid beads with short side branches. 8. An artificially produced light having a temperature of 4.000°C. 9. An organ highly sensitive to sound waves. 11. An explosive. 12. The potential difference between the two terminals of a generator responsible for the current (jumbled spelling). 14. A medium through which bacilli may be transmitted from an animal to man (jumbled spelling). 15. Minerals which can be mined at profit. 17. Einstein's theory of relativity established a definite relation between this and matter (reversed spelling). 18. The symbols used in wireless to indicate a source of electricity.

Clues down

2. An iron container covered with tin. 3. It was once believed to be indivisible (reversed spelling). 4. An electric meter helps to calculate this (jumbled spelling). 5. A famous yarn developed from discoveries by Caruthers. 10. An electro-magnetic wave of extremely small wave-length, travelling with the speed of light (reversed spelling). 12. The end of a rope vibrates four times each second and the velocity of wave propagation is 20 feet per second. How many feet long is each wave that is formed in the rope? 13. The theory of potential difference assumes that electric charges—from one point to another. 16. Unit of work.

2. Name:

a. The source of electric supply employed for operating an induction coil.

____

b. Two parts of an electro-magnet.

i. ______________________ ii. ______________________

c. Two forms of tuberculosis.

i. ______________________ ii. ______________________

d. The principal ore from which tin is obtained.

____

e. The part of a triode valve which emits electrons.

____

f. The bone of the ear connected to the tympanic membrane.

____

g. The element which is used as standard in the comparison of atomic mass.

____

h. The unit used for measuring the speed of alpha rays.

____

i. An animal fibre made by a moth.

____

j. A heredity unit.

____

3. State :

a. Four effects of an electric current.

i. __________ ii. __________ iii. __________ iv. __________

b. Two factors on which the frequency of an oscillating current depends.

i. ______________________

ii. ______________________

c. Three mediums for the transmission of sound.

i. ______________ ii. ______________ iii. ______________

d. Two uses made of ultra-violet rays.

i. ______________________ ii. ______________________

e. Two ways of mining coal.

i. ______________________ ii. ______________________

f. Two processes for releasing enormous amounts of energy.

i. ______________________

ii.__________

g. Two things that must be done to ethylene in order to convert it to polythene.

i.__________

ii.__________

h. Five assumptions in the theory of natural selection.

i.__________ ii.__________

iii.__________ iv.__________

v.__________

i. Three things that must be done to water to ensure that it is pure to drink.

i.__________ ii.__________ iii.__________

j. Three internal defences of the body which protect us against micro-organisms.

i.__________ ii.__________ iii.__________

4. What is meant by.

a. 'Cat-cracking'?

____

____

b. Heavy water?

____

c. Electrically neutral?

____

____

d. Damped currents?

____

____

____

e. Pig iron?

____

5. Group I is a list of names of famous scientists. Group II is a list of discoveries and inventions. Write the letter of each name in the appropriate blank space in Group II at the left of the discovery or invention associated with that name. In the blank space at the right write the nationality of the scientist.

Group I—Scientists

A. Caruthers. **B.** Curie. **C.** Darwin. **D.** DeVries. **E.** Goodyear.
F. Faraday. **G.** Fermi. **H.** Hahn. **I.** Koch. **J.** Marconi.
K. Maxwell. **L.** Mendel. **M.** Oersted. **N.** Rontgen. **O.** Thomson.

Group II—Inventions or discoveries

______ **i.** Magnetic effect of a current.______
______ **ii.** Laws of electrolysis.______
______ **iii.** Theory of propagation of electro-magnetic waves.______
______ **iv.** Wireless aerial.______
______ **v.** X-rays.______
______ **vi.** Radium______
______ **vii.** Electron.______
______ **viii.** Vulcanisation.______
______ **ix.** Uranium fission.______
______ **x.** Controlled chain reaction.______
______ **xi.** Principle of producing synthetic fibres.______
______ **xii.** Theory of natural selection.______
______ **xiii.** Mutation theory.______
______ **xiv.** Laws of heredity.______
______ **xv.** Cholera bacteria.______

6. Group I is a list of instruments developed by scientists which aid them in making observations and in collecting scientific data. Group II is a list of activities of scientists. On the blank space before each activity, write the letter of the instrument which is used.

Group I—Instruments

A. Ammeter. **B.** Condenser. **C.** Galvanometer. **D.** Hydrometer. **E.** Mass spectrograph.
F. Microscope. **G.** Sonometer. **H.** Triode valve. **I.** Tuning fork. **J.** Voltmeter.

Group II—Activities

______ **i.** Detecting an electric current.
______ **ii.** Measuring the intensity of an electric current.
______ **iii.** Measuring the potential difference of an electric current.

NAME ____________________ CLASS ____________ DATE ____________

_____ **iv.** Increasing the capacity of a conductor.

_____ **v.** Producing variations in an electric current.

_____ **vi.** Varying the frequency of a wire by adjusting the length of the wire.

_____ **vii.** Producing sound vibrations of a certain definite frequency.

_____ **viii.** Determining the masses of individual atoms.

_____ **ix.** Making a blood test.

_____ **x.** Testing the specific gravity of an accumulator.

Score: ____________ **Teacher's initials:** ____________________

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